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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,906	06/22/2006	Masashi Takahashi	06364/HG	7375

1933 7590 03/31/2009

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EXAMINER	
QIAN, YUN	
ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
03/31/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,906	TAKAHASHI, MASASHI	
	Examiner	Art Unit	
	YUN QIAN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3,4,6-17,19,21 and 23-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3,4,6-17,19,21 and 23-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/16/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 3-4, 6-17, 19, 21, 23-26 are remained for examination. Claims 3, 9, 12 and 15 have been amended. Claims 5, 18, 20 and 22 have been cancelled. Claims 23-26 are new claims. Claims 1-2 are previously canceled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-4, 6-11, 15-17, 19, 21, and 23-26, are rejected under 35 U.S.C.103 (a) as being unpatentable over Hideji et al. (JP 05-279043) in view of Bezzi et al. (US 4,202,793).

Regarding claims 3 and 16, Hideji et al. teaches a method of preparing uranyl nitrate solution comprising steps of (1) dissolving U_3O_8 powder in a nitric acid, in the presence of additives such as a photolysis halt agent (tetrahydorfurfuryl alcohol, THFA) and a surfactant (2) mixing a thickener (such as polyvinyl alcohol, PVA) and pure water, (3) combining the uranyl nitrate solution with aqueous thickener solution, (4) adding pure water as preparation of concentration or viscosity ([0010]-[0013]).

Although Hideji et al clearly points out to include THFA in the composition to **effectively** prevent the uranium catalyzed photolysis of binder resin ([0011]), he does

not specifically teach the concentration of THFA (40-50% vol.) as the instant claims 3 and 16.

Bezzi et al. discloses a method of making microspheres of uranium oxide comprising a step of mixing uranyl nitrate, tetrahydorfurfuryl alcohol, furfuryl alcohol, acrolein, aq. ammonia and water at room temperature (Col.5, lines 34-39, Example 4). Although the concentration of THFA taught by Bezzi et al. is about 38%, it is considered to be a result effective variable because, one of ordinary skill in the art would be expected to be able to adjust the concentration to afford high quality of microspheres of uranium oxides.

The temperature is also considered to be a result effective variable because, one of ordinary skill in the art would be expected to be able to adjust the temperature to arrive at an optimal temperature range (i.e. achieving a homogeneous aqueous solution of THFA) and simplify the manufacture process.

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bezzi and Hideji to obtain the invention as specified in the claim 3, motivated by the fact that the resulting microspheres of uranium oxides having exceptional characteristics of sphericity, high tensile strength etc. (col.2, lines 59-61).

The invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claims 4, and 15 as discussed above, PVA in the composition taught by Hideji et al. is from 2 g/L -50 g/L, which overlaps the claimed ranges ([0011]). The reference differs from Applicant's recitations of claims by not disclosing identical ranges. However, the reference discloses "overlapping" ranges, and overlapping ranges have been held to establish prima facie obviousness (MPEP 2144.05).

Regarding claims 6 and 19 as discussed above, although Bezzi et al. teaches mixing of the uranyl nitrate solution with THFA with stirring (col.3, col.5, line 36), he fails to teach degassing as per applicant claims 6 and 19. It is a routine practice and it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to do for preventing oxidize and coloring, and improving the products quality.

Regarding claims 7, and 23-24, the concentration of uranium taught by Hideji et al. is 120 -250 gU/L (0.5 mol-U/L-1.05 mol-U/L), which encompasses the claimed ranges ([0011]).

Regarding claims 8, 17, 21, and 25-26 as discussed above, although the amount of THFA taught by Bezzi et al. is about 38% which is encompassed by the instant claim 17, he fails to disclose mixing THFA with PVA at least at 50^0C as per instant claims 8, 17, 21, and 25-26.

The temperature is considered to be a result effective variable because, one of ordinary skill in the art would be expected to be able to adjust the temperature to arrive at an optimal temperature range to achieve a homogeneous aqueous solution of THFA

and PVA, avoid gel formation. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claim 9, although Hideji et al. fails to teach using the dried PVA, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a pre-dried PVA, as for preparing the same scale of aqueous PVA solution, a same amount of water is added. It will simplify the manufacturing process and produce a high quality product. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made

Regarding claims 10-11, it is well recognized in chemistry for removing water from solids via a vacuum desiccator over desiccant at an appropriate temperature (http://designerdrugs.com/pte/12.162.180.114/dcd/chemistry/equipment/dryingchemica , Purification of Laboratory Chemicals, Pergamon Press 1980 (2nd Ed.), pp 20-25, by DD Perrin, WLF Armarego, DR Perrin) Therefore, the instant claims 10-11 are considered obvious to one of ordinary skill in the art at the time the invention was made.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as combined above, and further in view of McLean II et al. (US 5,698,173) and Larson et al (5,514,306).

Regarding claim 12, although Hideji et al. teaches dissolving U_3O_8 into HNO_3, he does not specifically teach the molar ratio of nitric acid to uranium as per applicant claim 12.

McLean II et al. disclose a method for making uranyl nitrate with the molar ratio of nitric acid to uranium 2.22 as shown below

$$\frac{1}{3}U_3O_8 + \frac{20}{9}HNO_3 \rightarrow UO_2(NO_3)_2 + \frac{2}{9}NO + \frac{10}{9}H_2O \quad \text{(eq. 2)}$$

On the other hand, Larson et al. discloses a method for making uranyl nitrate according the equation as shown below (the molar ratio of nitric acid to uranium=2.67) (col. 5, lines 7-14):

$$U_3O_8 + 8HNO_3 \rightarrow 3UO_2(NO_3)_2 + 2NO_2 + 4H_2O$$

These equations taught by McLean and Larson et al. are identical to the instantly claim 12.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of McLean, Larson and Hideji et al. to obtain the invention as specified in the claim 12, motivated by the fact that the consumption of nitric acid of McLean is reduced by 56% per mole of uranium, while NO production is reduced by 89% (col.4, lines 32-35). Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claim 13, the uranium oxides taught by McLean II et al. is dissolved in hot (85 ^{0}C) nitric acid solution at approximately 10 molar concentrations (Col. 5, lines 60-61, Example 1). It is encompassed by the instant claim 13.

Regarding claim 14, the NO_x taught by McLean II et al. is further treated though NOx abatement system 26 as instant claim (col.4, lines 34-36 and Fig. 1)

Response to Arguments

Applicant's amendments, filed on January 9, 2009, are acknowledged.

In light of the amendment, the rejection under 35 U.S.C 112(2) with respect to claims 3, 8 and 15 has been withdrawn.

Regarding claims 3-11, and 18-22, applicant's amendments overcome the rejection to set forth in the First Office Action, Section of Claim Rejection under 35 U.S.C.103 (a) as being unpatentable over Hideji et al. (JP 05-279043).

Regarding claims 12-14, applicant's amendments overcome the rejection to set forth in the First Office Action, Section of Claim Rejection under 35 U.S.C.103 (a) as being unpatentable over Hideji et al (JP 05-279043), further in view of Larson et al (5,514,306) and Krishnamurthy et al (4,778,665).

Applicant's arguments with respect to claims 15-17 rejected under 35 U.S.C. 103 (a) as unpatentable over Hiroji (JP 06-066756) have been fully considered, but they are not persuasive.

Paragraph [0006] taught by Hiroji et al. discloses a composition **including** 20-30 parts by weight of water, **9-11 parts by weight of polyvinyl alcohol**, 2-3.5 parts by weight of acetylene black, 1.0-2.8 parts by weight of powdery graphite, 2.0-3.0 parts by

weight of boron nitride, **15-20 parts by weight of tetrahydrofurfuryl alcohol**, and 1.0-2.0 parts by weight of n-octyl alcohol.

Both Hiroji et al. and the instant claim 15 use the transitional phrases "including" and "comprises". They are inclusive or open-ended and do not exclude additional, unrecited elements or method steps. See MPEP 2111.03.

Therefore, the percentage of polyvinyl alcohol taught by Hiroji et al. is from 9-11% Wt (not 17.9-29.7% suggested by applicant, it might be calculated only based on above mentioned components), which meet the limitation of instant claim 15.

Regarding the recitation in the claims that the feed stock liquid is “for production of ammonium diuranate particles” is merely an intended use. Applicants attention is drawn to MPEP 2111.02 which states that intended use statements must be evaluated to determine whether the intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, and then it meets the claim.

It is the examiner’s position that the intended use recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art and further that the prior art structure is capable of performing the intended use. Given that Hiroji et al. disclose as presently claimed, it is clear that the composition of Hiroji et al. would be capable of performing the intended use, i.e. for

production of ammonium diuranate particles, presently claimed as required in the above cited portion of the MPEP.

As such, the rejections respect to claims 15-17 stand.

Conclusion

Applicant's amendments overcome the rejections set forth in the First Office Action, Section of Claim Rejection-35 USC 112, claims 3, 5 and 8.

Regarding claims 3-11, and 18-22, applicant's amendments overcome the rejection to set forth in the First Office Action, Section of Claim Rejection under 35 U.S.C.103 (a) as being unpatentable over Hideji et al. (JP 05-279043).

Regarding claims 12-14, applicant's amendments overcome the rejection to set forth in the First Office Action, Section of Claim Rejection under 35 U.S.C.103 (a) as being unpatentable over Hideji et al (JP 05-279043), further in view of Larson et al (5,514,306) and Krishnamurthy et al (4,778,665).

Regarding claims 15-17, the rejections under 35 U.S.C. 103(a) as being unpatentable over Hiroji (JP 06-066756) stand as discussed above.

Claims 1-2, 5, 18, 20 and 22 have been cancelled.

New ground rejections with respect to claims 3-4, 6-17, 19, 21, and 23-26 are filed under 35 U.S.C 103 (a) as discussed above.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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